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is divided. One-half is sour, like a Greening, and the other half is sweet, like the Tallman. This is one of the most peculiar freaks which has ever been observed in vegetation. Its oddity, as well as its fine bearing qualities, and the excellent quality of the fruit, both the sweet and sour portion, will make it immensely popular."

I also send for your examination a *Dahlia* stem bearing two flowers of different colors.

E. LEWIS STURTEVANT.

SOUTH FRAMINGHAM, MASS., October 6, 1896.

[The one *Dahlia* is light pink, becoming darker towards the center, the other dark maroon with a few pink petals near the center. Ed.]

THE LIMITS OF SCIENCE.

PRESIDENT MEES, in his address before Section B (Physics) of the American Association for the Advancement of Science (printed in the last number of this JOURNAL) states that the progress of science "may be expressed by a curve approaching truth asymptotically, probably never in human experience approaching to its *complete* knowlege. So long as investigators find that they are working upon the steep part of the curve where it approaches truth rapidly, there is no lack of interest; this, however, seems to die out quickly when much labor and great patience are required to extend experimentally the curve now more slowly approaching complete knowledge, or straighten out some of its irregularities."

I should myself regard the progress of science from a very different point of view. Knowledge does not seem to me to approach final truth as an asymptote, but rather to be an irregular sphere in endless space. The more we enlarge our little sphere the greater is the surface at which our knowledge touches our ignorance. The more we learn the greater is the area immediately awaiting exploration.

It is true, as President Mees states, that a man or group of men of unusual insight carry forward our knowledge, and the details must be filled in until the average has arrived at the point reached by the positive variations. Then new positive variations carrying our knowledge further are more likely. But there has never before been a time when it was pos-

sible for a man of genius to make such great advances and in so many directions.

J. MCKEEN CATTELL.

COLUMBIA UNIVERSITY.

RUTGERS COLLEGE MUSEUM.

TO THE EDITOR OF SCIENCE: The Geo. H. Cook Museum of Geology occupies the two upper stories of Geological Hall, which was built in 1871. The museum proper is 84 feet long, 40 feet wide and about 23 feet high, with a gallery 6 feet wide on all sides. The upper and lower class rooms open directly into the museum by double doors.

The Cook collection of minerals occupies six cases on the east side of the room, and numbers over 4000 specimens. The fossils, and specimens illustrating geology, are arranged in six cases on the west side, which, with two large cases on the floor, of rocks, iron and zinc ores, clays, sands and marls (including fossil bones and shells found in the marls) of New Jersey, number 5250 specimens.

The Lewis C. Beck collection of minerals fills two large cases on the floor, and contains 3000 specimens, mostly collected over fifty years ago. Many of them are the original specimens used in some of the old State reports and text-books, and it is really a historic collection of great value to the mineralogist. The pseudomorphs are specially valuable to the lithologist and mineralogist. The center of the floor is occupied by a case of Ellenville quartz crystals, showing also crystals of Chalcopyrite, Sphalerite and Galenite. This collection is a gem!

On the floor near the entrance is a mass of Jura-Trias sandstone 8x18 feet, from Morris Co., N. J., showing fifteen species of dinosaurian footprints. This is said to be the largest and best specimen of saurichnites in this country.

The Mannington (N. J.) mastodon, which was set up last June, covers a space 8x20 feet at the north end of the room.

A diamond-drill core in the gallery shows a section of the rock at the Franklin zinc mines, 1378 feet in depth.

Cases are being built for the large collection of paleolithic implements numbering about 1500 specimens, which include many fine pipes and ceremonial and ornamental objects.

At various places around the room are basaltic columns, fossil tree trunks, large rock specimens, etc.

Besides the mineralogical and geological specimens, there is a collection of 1550 recent mollusks, a botanical collection, large mahogany and tulip tree sections, charts showing Japanese drawings of fishes, a Japanese spider crab (*Macrocheirus Camperi*), which measures 11 feet 6 inches, skeleton of a Right Whale, caught in the Raritan, large antlers, etc.

Prof. A. H. Chester, curator of the museum, has his fine collection of over 4000 mineral specimens, in cases, in one of the class rooms.

All of the collections are being relabeled and classified, and all but three cases are finished.

Accessions are constantly being made by purchase, exchange and gift. The museum is free to all students or visitors every week day from 8 to 12 a. m. and 1 to 5 p. m. A collector and student of forty years' experience is constantly in attendance, to show and to answer any questions pertaining to the collections.

W. S. VALIANT,

RUTGERS COLLEGE MUSEUM. *Assistant Curator.*

SCIENTIFIC LITERATURE.

An Illustrated Flora of the Northern United States, Canada and the British Possessions from Newfoundland to the parallel of the southern boundary of Virginia, and from the Atlantic Ocean westward to the 102d meridian. By NATHANIEL LORD BRITTON, PH. D., and HON. ADDISON BROWN. In three vols. I., Ophioglossaceæ to Aizoaceæ. New York, Charles Scribner's Sons. 1896.

This, the first volume of Dr. N. L. Britton's magnificent descriptive flora, establishes a new level for plant-taxonomic publications in America. It emphasizes the passing of the old régime and introduces, in most fitting style, the new ideas in book-making, in description, in arrangement and in nomenclature. Wisely published at a price that places it within the reach of all, and certainly to be completed within a few months, it must become at once the standard for the region which it covers. There is no work extant in the whole series of American botanical publications which deal with descriptions of the flowering plants that can for a mo-

ment be compared with it either for a skilful and delightful presentation of the subject-matter or for modern, scientific and accurate mastery of the thousand-fold mass of detail of which such a work must necessarily consist. Such a volume marks the existence of a world's botanical center at New York City not to be unfavorably compared with any other anywhere. The publication of such a work is a proper occasion not only for personal and institutional, but also for national congratulations.

Dr. N. L. Britton, assisted (especially on the financial side) by Hon. Addison Brown, has in this first volume described and figured 1,425 species of plants under 332 genera. This number includes 109 species of ferns and fern-allies, 25 species of conifers and 1,011 species of monocotyledons, the remainder being dicotyledonous plants in the families from Saururaceæ to Aizoaceæ inclusive. The descriptions of Pteridophyta are by Professor Lucien M. Underwood, of Juncaceæ by Mr. F. V. Coville, of Polygonaceæ and Euphorbiaceæ by Dr. John K. Small, of Graminaceæ by Mr. G. V. Nash, of Lemnaceæ by Mr. E. P. Sheldon, while the text of Typhaceæ, Sparganiaceæ, Naiadaceæ, Scheuchzeriaceæ, Araceæ, Eriocaulaceæ, Pontederiaceæ, Smilacaceæ and Orchidaceæ, "was prepared by the late Rev. Thomas Morong and printed with very little change from his manuscript." Notwithstanding the element of collaboration which has entered into the production of this illustrated flora, there has, by careful editorial supervision, been maintained a wonderfully regular, direct and transparent style of description, so that the form under which one species is described will *mutatis mutandis* suffice for any other species. The appropriate sequences are observed and for each species there are given in order the Latin name, the English name, the synonym and citation of original publication, the description of the plant as a whole, of the vegetative tract, of the inflorescence, flowers and fruit, closing with the habitat followed by the range and time of blooming. These compact and masterly descriptions are in pleasing contrast to the rambling unsystematic accounts which are too often put forward instead of descriptions by taxonomists who lack the highest gifts of insight or expression.